our article alludes to, hybrid techniques employing a navigation system in tandem with a local imaging method, such as endobronchial ultrasound, may also be useful.

We appreciate the authors providing the 5-year experience of their institution. Preoperative diagnosis was made in 107 of 142 patients (75%) in advance of their lung cancer operations; the rate for preoperative diagnosis of peripheral lesions was 79% (58 of 73 patients). This rate is excellent by today’s standards; stratification of yield by size would be useful in view of the wide range in lesion size (1 to 10 cm). We support the idea of a bronchoscopy initiative that would allow our specialty to measure individual and collective lung cancer diagnostic performance and to work toward an even higher yield.

At present, many clinicians send patients with stage T1 (<3 cm) and T2 (>3 cm) [N0] lesions to undergo resection without a preoperative tissue diagnosis. The most obvious limitation is that nonmalignant lesions (and normal lung) are occasionally resected. If neoadjuvant chemotherapy ever becomes the standard of care for these early-stage lesions, the need for improved preoperative diagnostic performance will become even more urgent.

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Cough and Aspiration

To the Editor:

In their recent article in CHEST (November 2008), Smith Hammond et al. concluded that, for patients after a stroke, an objective assessment of voluntary cough (VC) is useful to assess the likelihood of aspiration. VC, starting with a deep inspiration, differs in muscular activities and timing from reflex cough. Furthermore, the initial inspiration would cause aspiration. However, touching the glottis of animals, including humans, causes the so-called expiration reflex (ER); the lack of an initial inspiration excludes aspiration. Compared with cough, the ER has different sensors, brainstem circuits and responses to antitussive agents, anesthesia, and physiologic and pathologic inputs. Its conduction delay from larynx to expiratory muscles (mean duration in humans, 17 ms) is too short to allow initial involvement of the cerebral cortex; this makes it unlikely that the ER can be voluntarily induced, except possibly as a "huff." There are simple methods of testing the ER (we use one).4

Subjective measurement of VC has not been shown to give less acceptable results than the objective method. One needs to compare simultaneous objective and subjective assessments, the latter by a trained observer. In another article,5,6 Smith Hammond included a figure showing that, compared with a healthy subject, a person with mild aspiration had a 90% smaller peak-to-peak oral airflow during VC, and a person with severe aspiration an 80% smaller peak-to-peak oral airflow during VC. A trained observer would easily have identified these differences subjectively (the examples may have been atypical). VC was correlated with other assessments of aspiration risk, but no respiratory outcomes were reported to indicate the significance of these findings.

Furthermore, of 30 patients with acute unilateral middle cerebral artery infarcts, 11 had a weak or absent VC but a normal ER, and pneumonia developed in none.6 Other studies (see Stephens et al6) have shown a correlation between a weak or absent ER and the occurrence of poststroke pneumonia.

VC assessed subjectively by a trained observer may be the simplest and cheapest method of assessing cough, but more sophisticated methods should concentrate on the reflex that prevents aspiration, the ER. Comparison of methods for assessing the risk of aspiration is limited in value because they cannot be related accurately to clinical outcome. Ideally, one would take a group of patients liable to aspirate, choose a method to assess this liability, and see in which patients signs and symptoms of aspiration develop without any preventative measures (or with identical preventative measures) applied to all the patients. This should not be done, for clear ethical reasons.

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Drs. Addington and Widdicombe have scientific and financial interests in Pneumoflex Systems, LLC.

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Response

To the Editor:

We appreciate Professors Widdicombe and Addington’s comments regarding our study of aspiration risk in stroke patients but disagree with their assertion that “subjective measurement of voluntary cough has not been shown to give less acceptable results than the objective method.” McCullough et al found that although the specificity of subjective bedside assessments of voluntary cough ranged from 79 to 89%, sensitivity was poor, ranging from 26 to 42%. This indicates that, if used alone, subjective assessment of voluntary cough would misclassify at least half of the patients at increased aspiration risk. Our results show that objective assessment of voluntary cough has sensitivities and specificities in excess of 90% in predicting patients at risk of aspiration, and this represents an improved accuracy over standard subjective measures. These findings indicate that objective measures of voluntary cough may be useful to screen stroke patients for the need for further evaluation of swallow function by a speech language pathologist. Therefore, the higher sensitivity and specificity of objective analysis of voluntary cough when compared to a traditional bedside assessment (including evaluation of reflexive cough) for the identification of aspiration risk is clinically important. The necessary equipment needed for voluntary cough testing is readily available and easy to use. The test can be completed quickly and is safe (ie, it does not require patients to risk aspiration by attempting to swallow any material).

We do not dispute that other measures of airway protection may also be clinically useful and agree that additional studies evaluating airway protection are needed. Further studies of this nature will help to refine screening tools and spur the development of novel interventions to reduce the stroke patient’s risk of aspiration.

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Excessive Daytime Sleepiness in Women Without OSA

To the Editor:

We read with great interest the recent article in CHEST (November 2008) entitled “Daytime Sleepiness Relates to Snoring: Independent of the Apnea-Hypopnea Index in Women From the General Population.” In their article, Svensson and colleagues demonstrated that both excessive daytime sleepiness (EDS) and daytime fatigue are related to habitual snoring independently of the apnea-hypopnea index (AHI). Previous reports have shown a possible correlation among AHI, EDS, and snoring. More recently, Young and colleagues reported daytime sleepiness in snoring men and women from a general population without sleep apnea; on the other hand, Gottlieb and colleagues showed an increased Epworth sleepiness scale (ESS) score in snoring men and women in different categories of apnea-hypopnea frequency. In addition, sleep apnea symptoms were also reported to occur at a lower AHI in women compared with men.

The pathophysiology of sleep-related disorders is likely to be different between women and men. Our group has previously evaluated, in a population of women with a body mass index of > 30 kg/m², the relationships between EDS, AHI, and snoring. We showed that habitual snoring and EDS were present in 47% and 35%, respectively, of obese women without obstructive sleep apnea (OSA), while women with habitual snoring showed the highest ESS score. Conversely, no correlations were observed among ESS, AHI, body mass index, and body fat distribution. Similar results were also reported by Klink et al, who showed that snoring was a significant risk factor for EDS in the general population.

The relationship between EDS and both snoring and OSA remains unclear. Svensson and colleagues hypothesized that snoring-related daytime sleepiness might be due to upper airway resistance syndrome, which is characterized by episodes of increased respiratory effort followed by arousals and daytime sleepiness. Other authors have demonstrated nocturnal hypor arousability and daytime hypoarousability in obese women. In our article, we showed a lower percentage of sleep in the rapid eye movement phase and lower sleep efficiency in obese snoring subjects compared with control subjects. On the other hand, the relationship between snoring and EDS in women from the general population needs to be elucidated. One possible explanation is that the upper airway vibrations from snoring may cause inflammation. Indeed, the levels of systemic inflammatory cytokines positively correlated with EDS and fatigue. Based on these results, it would seem conceivable to treat the snoring.

In this regard, many authors have shown that the presence of habitual snoring strongly correlates with cardiovascular morbidity, independently of sleep apnea. Taken together, these results suggest

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